AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions or listings of claims for this application.

Listing of Claims:

1. (Previously presented) A method of forming a chalcogenide comprising device, comprising:

forming a first conductive electrode material on a substrate;

forming an amorphous chalcogenide comprising material to a first thickness over the first conductive electrode material, the chalcogenide material comprising A_xB_y, where "B" is selected from the group consisting of S, Se and Te and mixtures thereof, and where "A" comprises at least one element which is selected from Group 13, Group 14, Group 15, or Group 17 of the periodic table;

forming a metal comprising layer to a second thickness over the chalcogenide comprising material, said second thickness being less than, but not within 10% of a transition thickness of said metal comprising layer, said transition thickness being a thickness of said metal layer which, when diffused into said chalcogenide comprising material, transforms said chalcogenide comprising material from an amorphous to a crystalline state;

irradiating said metal comprising layer such that at least some of the metal is diffused into the chalcogenide material; and

forming a second conductive electrode over the chalcogenide comprising material.

2. (Original) The method of claim 1 wherein the irradiating is effective to form the chalcogenide material to have a first region which is displaced from the interface at least by an interface region having a higher content of "A" than the first region.

3. (Original) The method of claim 1 wherein "A" comprises Ge.

4. (Original) The method of claim 1 wherein "A" comprises Ge, and "B" comprises Se.

5. (Original) The method of claim 1 wherein "A" comprises Ge, "B" comprises Se, and the metal comprises Ag.

6. (Previously Presented) The method of claim 1 comprising forming the device into a programmable memory cell of memory circuitry.

7. (Previously presented) The method of claim 1, wherein the second thickness is less than but not within 25% of the transition thickness.

8. (Previously presented) The method of claim 1, wherein the second thickness is less than but not within 50% of the transition thickness.

9. (Previously presented) The method of claim 1, wherein the second thickness is less than but not within 65% of the transition thickness.

10. (Previously presented) The method of claim 1, wherein the second thickness is less than but not within 85% of the transition thickness.

11. (Original) The method of claim 1 wherein the first and second conductive electrode materials are different.

12. (Original) The method of claim 1 wherein the second electrode material predominately comprises elemental silver.

13. (Previously presented) A method of forming a programmable memory cell of a memory circuitry, comprising:

forming a first conductive electrode material on a substrate;

forming an amorphous chalcogenide comprising material to a first thickness over the first conductive electrode material, the chalcogenide material comprising A_xB_y, where "B" is selected from the group consisting of S, Se and Te and mixtures thereof, and where "A" is selected from the group consisting of Ge, Si and mixtures thereof;

forming a layer comprising Ag to a second thickness over the chalcogenide comprising material; said second thickness being less than, but not within 10% of a transition thickness of said Ag comprising layer, said transition thickness being a thickness of said Ag comprising layer which, when diffused into said chalcogenide comprising material, transforms said chalcogenide comprising material from an amorphous to a crystalline state;

irradiating said Ag comprising layer such that at least some of the Ag is diffused into the chalcogenide material; and

forming a second conductive electrode material over the chalcogenide material.

14. (Original) The method of claim 13 wherein the irradiating is effective to form the chalcogenide material to have a first region which is displaced from the interface at least by an interface region having a higher content of "A" than the first region.

15. (Original) The method of claim 13 wherein the second electrode material predominately comprises elemental silver.

16. (Previously presented) A method of forming a chalcogenide comprising device, comprising:

forming a first conductive electrode material on a substrate;

forming an amorphous chalcogenide comprising material to a first thickness over the first conductive electrode material, the chalcogenide material comprising AxBy, where "B" is selected from the group consisting of S, Se and Te and mixtures thereof, and where "A" comprises at least one element which is selected from Group 13, Group 14, Group 15, or Group 17 of the periodic table;

forming a metal comprising layer to a second thickness less than the first thickness over the chalcogenide comprising material, said second thickness being less than, but not within 50% of a transition thickness of said metal comprising layer, said transition thickness being a thickness of said metal layer which, when diffused into said chalcogenide comprising material, transforms said chalcogenide comprising material from an amorphous to a crystalline state;

irradiating the metal effective to break a chalcogenide bond of the chalcogenide material at an interface of the metal and chalcogenide material and diffuse at least some of the metal into the chalcogenide comprising material, and said chalcogenide comprising material remaining amorphous after the irradiating, the chalcogenide comprising material after the irradiating having a first region which is displaced from the interface at least by an interface region having a higher content of "A" than the first region; and

forming a second electrode material operatively proximate the chalcogenide material.

17. (Original) The method of claim 16 comprising forming the interface region to have a thickness of less than or equal to 100 Angstroms.

18. (Original) The method of claim 16 comprising forming the interface region to have a thickness of at least 10 Angstroms.

19. (Original) The method of claim 16 comprising forming the interface region to have a thickness of less than or equal to 100 Angstroms, and of at least 10 Angstroms.

20. (Original) The method of claim 16 comprising forming the second electrode material to be continuous and completely covering at least over the chalcogenide material.

21. (Original) The method of claim 16 comprising forming the interface region to be substantially homogenous.

22. (Original) The method of claim 16 comprising forming the interface region to not be substantially homogenous.

23. (Original) The method of claim 16 comprising forming the interface and first regions to have substantially the same concentration of the metal.

Claims 24-25 (Cancelled).

26. (Original) The method of claim 26 wherein the second electrode material predominately comprises elemental silver.

27. (Currently amended) A method of forming a programmable memory cell of memory circuitry, comprising:

forming a first conductive electrode material on a substrate;

forming an amorphous chalcogenide comprising material to a first thickness over the first conductive electrode material, the chalcogenide material comprising AxBy, where "B" is selected from the group consisting of S, Se and Te and mixtures thereof, and where "A" is selected from the group consisting of Ge, Si and mixtures thereof;

forming a layer comprising Ag to a second thickness less than the first thickness over the chalcogenide comprising material, said second thickness being less than, but not within 50% of a transition thickness of said metal comprising layer, said transition thickness being a thickness of said metal layer which, when diffused into said chalcogenide comprising material, transforms said chalcogenide comprising material from an amorphous to a crystalline state;

irradiating the metal effective to break a chalcogenide bond of the chalcogenide material at an interface of the metal and chalcogenide material and diffuse at least some of the metal into the chalcogenide comprising material, and said

chalcogenide comprising material remaining amorphous after the irradiating, the chalcogenide comprising material after the irradiating having a first region which is displaced from the interface at least by an interface region having a higher content of "A" than the first region; and

forming a second electrode material operatively proximate the chalcogenide material.

28. (Original) The method of claim 27 wherein the second electrode material predominately comprises elemental silver.

Claims 29-41. Cancelled.

42. (Previously presented) The method of claim 24, wherein said second thickness is less but not within 10% of said transition thickness.

43. (Cancelled).

44. (Previously presented) The method of claim 29, wherein said second thickness is less than but not within 10% of said transition thickness.

45. (Cancelled).